

Amendments to the Claims

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-79. (Cancelled)

80. (New) A system for image formation comprising:

a set of photosensor elements, each configured to generate a photosensor output signal in response to light received thereon;

a plurality of micro-optic elements, each of which is configured to direct light from a portion of an object onto a respective subset of the set of photosensor elements; and

at least one signal processor configured to:

receive photosensor output signals from the set of photosensor elements,

perform an image formation operation on the received photosensor output signals to create first image data,

perform a digital processing operation on the first image data to produce second image data, the digital processing operation including at least one of an edge effect handling operation to remove edge effects, a sharpening operation and an aggregation operation, and

provide output image data based on the second image data, the output image data representing a portion of an image of the object.

81. (New) The system of claim 80, wherein the photosensor elements are arranged in a first array and the micro-optic elements are arranged in a second array.

82. (New) The system of claim 81, wherein the image formation operation includes a deconvolution operation based on an overlap impulse response determined by properties of respective micro-optic elements associated with each of the set of photosensor elements.

83. (New) The system of claim 82, wherein the deconvolution operation comprises a two-dimensional overlap deconvolution operation.

84. (New) The system of claim 80, wherein the sharpening operation comprises removing effects in the first image data due to overlap of the photosensor elements.

85. (New) The system of claim 80, wherein the micro-optic elements are fabricated as a component of respective photosensor elements.
86. (New) The system of claim 80, wherein the micro-optic elements are fabricated using at least one of a microlens fabrication technique and a planar optic fabrication technique.
87. (New) The system of claim 81, further comprising:
a plurality of display elements arranged in a third array and interleaved with the photosensor elements, the display elements being configured to emit light representative of a respective display signal, and the display elements and the photosensor elements being configured to operate sequentially so as to ensure that display generation and image capture operations do not interfere with one another.
88. (New) The system of claim 80, wherein the at least one signal processor is further configured to perform at least one of a decimation operation and an interpolation operation on at least one of the photosensor output signals and the first image data.
89. (New) The system of claim 80, wherein the edge effects are caused by a first set of photosensor elements positioned within a peripheral region of the photosensor array.
90. (New) The system of claim 80, wherein the edge effect handling operation to remove edge effects comprises a crop operation to remove from subsequent processing portions of the first image data.
91. (New) The system of claim 80, wherein the micro-optic elements are configured in a configuration to reduce edge effects in the output image data.
92. (New) The system of claim 80, wherein the micro-optic elements are configured to have a localized overlap impulse response.
93. (New) The system of claim 80, wherein the aggregation operation comprises the aggregation of processed versions of the first image data.
94. (New) A system for image formation comprising:
a plurality of photosensor elements arranged in a first array;
a plurality of micro-optic elements, each of the micro-optic elements configured to direct light from a portion of an object onto a respective subset of the photosensor elements,

each of the photosensor elements configured to generate a photosensor output signal in response to light received;

a capture control circuit configured to scan the output signals generated by the photosensor elements on a line-by-line basis; and

an image processing unit configured to:

receive from the capture control circuit the photosensor output signals generated during a respective photosensor line scan;

perform at least one digital image processing operation on the photosensor output signals generated during the photosensor line scan; and

based on the signals generated by the digital image processing operation, provide respective output image signals, each of which represents a respective portion of an image of the object.

95. (New) The system of claim 94, further comprising: signal conditioning circuitry configured to perform at least one signal conditioning operation including at least one of amplifying the photosensor output signals and reducing noise in the output signals generated by the photosensor elements.

96. (New) The system of claim 95, wherein the signal conditioning circuitry is integrated with the plurality of photosensor elements.

97. (New) A method for image formation comprising:

using a plurality of micro-optic elements to direct light from a portion of an object onto a respective plurality of photosensor elements;

generating from each of the photosensor elements a photosensor output signal in response to light received thereon;

receiving the photosensor output signals and performing thereon a digital processing operation, wherein the digital processing operation includes one of an edge effect handling operation to remove edge effects represented in the output signals, a sharpening operation and an aggregation operation; and

outputting based on the digitally processed output signals respective image signals, each of which represents a respective portion of an image of the object.

98. (New) The method of claim 97, further comprising:

arranging the plurality of photosensor elements in a first array;

scanning the photosensor output signals generated by the photosensor elements on a line-by-line basis; and

performing the digital image processing operation on photosensor output signals generated during the line-by-line photosensor scan.

99. (New) The method of claim 98, further comprising:

arranging a plurality of display elements in a second array;

interleaving the display elements with the photosensor elements, wherein the display elements are configured to emit light representative of a respective display signal; and

operating the display elements and the photosensor elements sequentially so as to ensure that display generation and image capture operations do not interfere with one another.